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# Effectiveness of Home-based Occupational Therapy for Early Discharged Patients with Stroke

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**Objective:** To verify the effectiveness of home-based occupational therapy for safe discharge of in-patients with recent stroke.
**Methods:** A pre/post interventional design was performed to document patients' outcome during 3 months following discharge. Interventions included improving functioning, reducing environmental risks and the risk associated with early discharge of homebound stroke patients, improving caregivers' handling skills through training, and providing on-site skills training for indoor and outdoor environments.
**Results:** Comparing pre- and post-interventional status, a sample of 144 patients showed improvements ($p < 0.05$) in Modified Barthel Index, risk reduction, Caregiver Strain Index, self-efficacy of patients and caregivers, in comparing pre- and post-intervention.. Self-perceived health status, frequency of excursions, and reported happiness at 28-day and 3-month follow-ups improved.
**Conclusion:** Reduction of environmental risks by on-site consultation, aids to support daily activities, and training in community living can improve functional performance of stroke patients. Furthermore, strengthening caregiver efficacy and patient self-efficacy can result in long-lasting benefit for patients' quality of life.

**KEY WORDS:** Home visits • Self-efficacy • Acute stroke • Early discharge programme

## Introduction

In most acute and sub-acute settings, the primary focus of a rehabilitation programme for stroke patients is 'preparation for discharge'. Nowadays, more individuals suffering from stroke are surviving with mild to moderate deficits (Duncan, 1998), and are left with significant disabilities and a lower quality of life. These disabilities can occur in mobility, self-care, or the ability to manage higher levels of daily activities (e.g. managing finances or medications, shopping, driving, etc).

Stroke recovery often produces patterns in which neurological and functional improvement do not necessarily correlate with each other. In other words, there may be functional recovery without much neurological improvement (Duncan, 1998). Motivation and learning to regain function are essential for recovery. Components that affect stroke patients' belief and behaviour have become increasingly important, and are currently being investigated (Duncan, 1998). A limitation in daily activity, especially in activities that are held outdoors, is common in mild to moderate stroke survivors. However, caregivers have tended to overestimate the functional abilities of

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a family member who is a recently discharged stroke patient, which typically imposes unreasonable expectations and burdens on the caregivers (Stein, Shafqat, Doherty et al., 2003). As Lawton and Nahemow (1973) defined in their Competency – Environmental Press Framework, "as competency declines, an unchanging physical and social environment poses significant demands or press on an individual that may result in negative behavioral and functional outcomes." Failure to maintain personal control may result in emotional upset and lowered self-efficacy (Schulz & Heckhausen, 1999).

Although home visits by occupational therapists for modifications of physical barriers is a common practise for long-stay stroke patients in the Hospital Authority of Hong Kong (OTCOC benchmarking stat., 2003), it is rarely provided in acute-stroke wards. However, the number of stroke survivors directly dis-charged from acute wards to home is much more significant than those who are discharged from the sub-acute hospitals (Hospital Authority of Hong Kong, 2004). In any case, it is evident that the sole removal of environmental hazards is not a significant factor for ensuring home safety, and that on-site advice and training that leads to changes in risky behaviours can motivate stroke survivors to live more safely, in both the home and outdoor environments (Cumming et al., 1999; Sattin, Rodriguez, De vito et al., 1998).

Self-efficacy seems to be consistently and significantly associated with the prediction of behavioural changes and control beliefs over the environment (Bandura, 1999). Higher self-efficacy will increase the motivation to maintain the functional gains in the longer term, and researchers have identified that if self-efficacy increases after a stroke, functional independence and quality of life also increase over time. Likewise, depression was shown to decrease over the mean time (Robinson-Smith, Johnston & Allen, 2000). Some studies (Friedman, Munoz, Sheila et al., 2002; Kressig, Wolf, Sattin et al., 2001) have already proven that activity restrictions secondary to the fear of falling could in turn lead to deconditioning and increased risk of fall. Caregivers with high perceived self-efficacy, who had a satisfactory level of social support, and had frequently used coping strategies and practical solutions, had higher mental well-being and vitality measures (van den Heuvel, de White, Schure et al., 2001).

Therefore, developing an occupational therapy programme that ensures a safe discharge and self-sustaining habits after stroke, for both patients and their caregivers, is essential. This therapeutic avenue can help achieve better and longer-lasting outcomes in patients with stroke, despite the increasingly shorter duration of hospital stay. The objectives of this study were to evaluate the effectiveness of home-based occupational therapy interventions, to improve patients' functional gains, reduce environmental risks, reduce the homebound incidence of early discharged stroke patients, and to investigate the programme's effectiveness in improving self-efficacy in patients and their caregivers, after discharge and in the follow-up period.

## Methods

This prospective study used a pre/post-test design. A convenience sample of 144 patients was selected according to set criteria from the medical wards of nine public acute hospitals in Hong Kong. Selection criteria included a medical diagnosis of cerebral vascular event with first onset and no reported cognitive impairments. Participants should have been discharged directly to their homes. Occupational therapists approached the patients and obtained informed consent for the study, including training, home visits and telephone follow-up at 28 days and 3 months after discharge. Structured caregiver training was provided by a case therapist, either in the pre-discharge phase or during the first home visit, according to the availability of the caregivers. Repeated measures by Modified Barthel Index (MBI; OTCOC, 2000), Caregiver Strain Index (CSI; Robinson, 1983), self-efficacy scale for patients – HK (SEQ; Ng, Cheng, Chu et al., 2002) and self-efficacy scale for caregivers – HK (CEQ; Ng, Cheng, Chu et al., 2002) were separately completed for patients and caregivers. A prototyped discharge telephone follow-up checklist, developed by the investigators, was completed by therapists with more than 5 years of experience in stroke rehabilitation, from the nine acute public hospitals. This checklist was used to record subjective progress in health status, self-care abilities, mobility status, frequency of 'going-out', fall incidents, admissions, and relative feeling of happiness. Environmental hazards were recorded by Safety Assessment of Function and the Environment for Rehabilitation (SAFER) (Letts & Marshall, 1995; Letts, Scott, Burtney et al., 1998; Oliver, Blathwayt, Brackley et al., 1993). Descriptive analysis, *t* test for continuous data, and sign rank test for categorical data were used to compare the pre- and post-intervention changes.

### *Interventions*

In order to ensure a safe discharge for the short-stay stroke patients, occupational therapists have to let the patients and their caregivers understand the intrinsic risk factors that affect safety in their homes. Patient's confidence level, daily habits, and safety awareness were some of the factors that were included. Occupational therapists have the responsibility to reduce extrinsic risk factors in the home environment as well as during outdoor activities.

The programme aimed to improve self-efficacy of patients and caregivers, and the scheme included: getting patients to "understand their limitations" in comparing with the pre-morbid state; "learn effective caring skills and problem solving abilities," especially when it was the first occasion that they encountered a stroke scenario; and to "ensure support and linkage to useful resources." Interventions were based on the work undertaken by the community occupational therapy services, which included caregiver skills training, on-site safety advice and training, assistive devices prescription, home modifications, referral to other services, and community-living skills training. The procedures of interventions were standardised and described in a previous study by the same working group (Cheng, Cheung, Wong et al., 2001). A panel was organised to review modalities and formulate an intervention programme to fit to the specific needs of discharged acute-stroke clients. These programmes covered frequency, intensity, and content of care under each modality. A standard caregiver training package was developed by a panel of case therapists from the participating centres.

The first home visit was conducted within the first 3 days of post-discharge. The SAFER assessment was done promptly to identify all potential hazards and caring problems within the home environment for 'Risk Reduction'. Extra sessions of training were given, according to the need of the individual patient. A post-SAFER assessment was also performed in the final visit.

## Results

### *Demographics*

In the sample of 144 patients, 74 (51.4%) were males, 120 (83.0%) were aged 65 years and above (mean 72.5 yrs; SD = 9.0) and 113 (79.0%) were living with their family, relatives or co-tenants (Table 1). Half of the patients were independent in daily activities before the onset of stroke. However, only 20% of the sample group was independent after discharge from the hospital.

The average number of home visits provided per patient was 1.9, and the mean days of the total follow-up period was 14.5 days. Within the sample, 69 (48%) required home modifications, 78 (54%) were provided with assistive devices, 117 (81%) received caregiver training, 111 (77%) were provided with on-site safety training, 29 (20%) required community living skills training and 29 (20%) of the group were referred to other additional services, including community nursing services, physiotherapy services and social security services. The majority of patients received more than one kind of intervention (Table 1).

**Table 1.** Demographics of the sample ($n$ = 144)

| | Frequencies |
|---|---|
| Gender | |
| Male | 74 (51.4%) |
| Female | 69 (47.9%) |
| Age (yr) | |
| 31–55 | 9 (6.3%) |
| 56–65 | 14 (9.7%) |
| 65–80 | 94 (65.3%) |
| > 80 | 26 (18.1%) |
| Living arrangement | |
| Alone | 17 (11.9%) |
| Alone daytime | 13 (9.1%) |
| Family | 105 (72.9%) |
| Relatives | 7 (4.9%) |
| Co-tenants | 1 (0.7%) |
| Other services on discharge | |
| PT | 2 (1.4%) |
| CNS | 58 (40.3%) |
| Home helper | 11 (7.7%) |
| Health centre | 7 (4.9%) |
| DCC | 8 (5.6%) |
| GDH | 13 (9.0%) |
| Others | 5 (3.5%) |

PT = physiotherapy; CNS = community nursing service; DCC = day care centres; GDH = geriatric day hospital.

### *Outcome measures*

Our sample was discharged with a mean MBI score of 72.96 (SD = 21.23) and improved up to 81.82 (SD = 21.55) after the completion of home visits within 2.76 mean days post-discharge. There was significant improvement ($p$ = 0.000) in all pre/post interventions (after 28 days) outcome measures, which included MBI; CSI mean pre-test = 6.69 ± 4.89; CSI mean post-test = 4.39 ± 5.06; SEQ mean pre-test = 25.44 ± 9.53; SEQ mean post-test = 32.00 ± 8.30; CEQ for caregivers mean pre-test = 24.6 ± 10.57; CEQ for caregivers mean post-test = 32.1 ± 8.64; SAFER index mean pre-test = 6.06 ± 4.52; and SAFER index mean post-test = 1.57 ± 2.38, in paired samples $t$ test (Table 2 and 3).

The telephone follow-up, comparing the results at day 28 and 3 months post-discharge, revealed no significant difference in self-reported health status, mobility status, self-care abilities and feeling of happiness in sign rank test for these categories of results ($p$ > 0.05). The rates of fall incidents at 28 days and 3 months were 10 (7%) and 12 (8%), respectively. The reported reasons of fall included general weakness and sudden weakness of limbs, which occurred mainly inside the patients' homes. The number of re-admission to the hospital due to fall incidents was 4 (3%), and there was no significant difference in re-admission rates (3 [3%]) within 3 months post-discharge. There was a significant increase in going-out

frequency, ranging from a mean of 5.4 to 6.4 in number of outings per week during the follow-up period ($p = 0.008$) (Table 4).

### *Interventions*

From the Pearson's correlation matrix, results indicated that home modifications ($p = 0.007$) and assistive devices prescription ($p = 0.001$) were significantly correlated with the number of risk factors identified by the SAFER assessment. On-site advice was also correlated with post-SAFER scores ($p = 0.039$), indicating that face-to-face contact is effective in identifying risks from the outset. Skills training, including caregiver training and community living skills training for either caregiver and/or patients, was significantly correlated with a patient's functional performance, as measured by MBI ($p = 0.004$ and $p = 0.011$, respectively) (Table 5).

Caregiver training ($p = 0.016$) and community living skills training ($p = 0.029$) also correlated with the number of pre-

**Table 2.** Descriptive statistics of all outcome measures

| | N | Minimum | Maximum | Mean | SD |
|---|---|---|---|---|---|
| DAYSHV | 144 | –18.00 | 29.00 | 2.7639 | 5.44263 |
| MBI1 | 144 | 0.00 | 100.00 | 72.9583 | 21.23293 |
| MBI2 | 144 | 0.00 | 100.00 | 81.8194 | 21.55158 |
| CSQ1 | 86 | 0.00 | 38.00 | 6.6860 | 4.89480 |
| CSQ2 | 86 | 0.00 | 40.00 | 4.3953 | 5.06494 |
| SEQ1 | 111 | 4.00 | 40.00 | 25.3874 | 9.42643 |
| SEQ2 | 109 | 10.00 | 40.00 | 32.0826 | 8.29896 |
| CEQ1 | 95 | 0.00 | 40.00 | 24.6000 | 10.56933 |
| CEQ2 | 95 | 0.00 | 40.00 | 32.1053 | 8.63870 |
| SAFER1 | 141 | 0.00 | 27.00 | 6.0638 | 4.52171 |
| SAFER2 | 141 | 0.00 | 12.00 | 1.5745 | 2.38218 |
| OUT28 | 98 | 0.00 | 14.00 | 5.1939 | 3.80628 |
| OUT3MTH | 90 | 0.00 | 21.00 | 6.4444 | 4.26933 |
| READ28 | 98 | 1.00 | 3.00 | 1.0612 | 0.28051 |
| READ3MTH | 90 | 1.00 | 3.00 | 1.1000 | 0.39803 |
| FALL28 | 98 | 1.00 | 2.00 | 1.0408 | 0.19888 |
| FALL3MTH | 90 | 1.00 | 2.00 | 1.1222 | 0.32938 |
| Valid N (listwise) | 53 | | | | |

DAYSHV = total days of intervention given; MBI = modified barthel index; CSI = caregiver strain index; SEQ = self-efficacy scale for patients; CEQ = self-efficacy scale for caregivers; SAFER = safety assessment of function and the environment for rehabilitation assessment; OUT = outing frequency; READ = rate of readmission to hospital; FALL = rate of fall; 1 = pre-testing score; 2 = post-testing score; 28 = follow-up at day 28; 3MTH = follow-up at 3 months.

**Table 3.** Paired samples *t* test of outcome measures (pre/post-tests, 28 days and 3 months)

| | Mean | SD | Standard | Paired differences 95% CI | | | *T* | df | Significance (two-tailed) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Error | Lower | Upper | | | |
| 1 | MBI1–2 | 8.86110 | 9.08750 | 0.75729 | –10.35800 | –7.36420 | –11.701 | 143 | 0.000† |
| 2 | CSQ1–2 | 2.29070 | 3.24261 | 0.34966 | 1.59552 | 2.98590 | 6.551 | 85 | 0.000† |
| 3 | SEQ1–2 | –6.56480 | 8.03296 | 0.77297 | –8.09710 | –5.03250 | –8.493 | 107 | 0.000† |
| 4 | CEQ1–2 | –7.50530 | 8.68096 | 0.89065 | –9.27370 | –5.73690 | –8.427 | 94 | 0.000† |
| 5 | SAFER1–2 | 4.48940 | 3.52869 | 0.29717 | 3.90180 | 5.07690 | 15.107 | 140 | 0.000† |
| 6 | FALL28–90 | –0.05950 | 0.32380 | 0.03533 | –0.12980 | 0.01070 | –1.685 | 83 | 0.096 |
| 7 | OUT28–90 | –1.02800 | 3.45706 | 0.37720 | –1.77400 | 1.27360 | –2.714 | 83 | 0.008‡ |
| 8 | READ28–90 | –0.02380 | 0.49030 | 0.05350 | –0.13020 | 0.08260 | –0.445 | 83 | 0.657 |

MBI = modified barthel index; CSQ = caregiver strain index; SEQ = self-efficacy scale for patients; CEQ = self-efficacy scale for caregivers; SAFER = safety assessment of function and the environment for rehabilitation assessment; FALL = rate of fall; OUT = outing frequency; READ = rate of readmission to hospital; 1 = pre-testing score; 2 = post-testing score; 28 = follow-up at day 28; 3MTH = follow-up at 3 month; ‡correlation is significant at the 0.000 level (two-tailed); †correlation is significant at the 0.01 level (two-tailed).

**Table 4.** Non-parametric test statistics of self-reported outcome measures (at 28 days and 3 months)

| | Health | Mobility | Self-care | Happiness |
|---|---|---|---|---|
| *Z* | –1.260 | –1.166 | –1.980 | –0.664 |
| Asymptomatic significance (two-tailed) | 0.208 | 0.243 | 0.843 | 0.507 |

**Table 5.** Pearson's correlation matrix for occupational therapy interventions

| | Home Mod | Assist device | Caregiver training | CLS training | On-site advice | Referral |
|---|---|---|---|---|---|---|
| MBI1 | –0.1854* | –0.2854† | –0.2420† | | | |
| MBI2 | –0.1961* | –0.2973‡ | –0.1913* | 0.2148† | | |
| SAFER1 | 0.2253† | 0.2671† | | | | |
| SAFER2 | | | | | –0.1744* | |
| Caregiver training | | 0.201* | | | | |
| CLS training | | –0.182* | | | | |
| On-site advice | | | | | | 0.285† |

Home Mod = home modification; CLS training = community living skills training; MBI = Modified Barthel Index; SAFER = Safety Assessment of Function and the Environment for Rehabilitation assessment; '1' = pre-testing score; '2' = post-testing score.

*Correlation is significant at the 0.05 level (two-tailed) ($p < 0.05$); †Correlation is significant at the 0.01 level (two-tailed) ($p < 0.01$); ‡Correlation is significant at the 0.000 level (two-tailed).

scriptions for assistive devices, which indicates that training in the use of these devices is important for effective utilisation of the devices in daily activities. On-site advice that helped solve the families' immediate problems were significantly correlated with making referrals to other resources or services ($p = 0.001$). This latter result indicates that providing resources and information by occupational therapists is essential for tackling immediate problems experienced in daily living (Table 5).

SEQ was significantly correlated with the MBI of the patients ($p = 0.000$). Further, correlation statistics have shown that gender and occupation were correlated with post self-efficacy score of patients (SEQ2) ($p < 0.05$). SEQ was also positively correlated with self-efficacy scores of their caregivers (CEQ; $p < 0.05$) (Table 6).

Caregiver self-efficacy scores, post-intervention by post self-efficacy score of caregivers (CEQ 2), were highly correlated with post caregiver strain index score (CSI 2) ($p = 0.000$), and negatively correlated with the number of risks factors left in the post-intervention SAFER assessment (SAFER 2); $p = 0.025$). In other words, the fewer the risks factors involved, the higher the self-efficacy of the caregivers. Types of caregivers, availability of social support in pre- and post-intervention were correlated with CEQ 2 as well ($p < 0.05$) (Tables 6 and 7).

In simple regression analysis for SEQ of patients (sum of squares = 3,656.758; df = 16; $F = 7.080$; $p = 0.000$), case-controlled for receiving occupational therapy service only by eliminating those receiving services such as physiotherapy or other support at the same time ($n = 80$), two co-variances were identified as significant predictors for change in SEQ. These co-variances were the patient's years of education ($p = 0.038$) and final MBI ($p = 0.000$). The same regression analysis was repeated for the CEQ of the caregiver (sum of squares = 3,509. 018; df = 17; $F = 4.712$; $p = 0.000$). The results show that the significant factors included the initial CEQ score ($p = 0.000$), the living arrangement of the patients ($p = 0.038$), if the subjects were cared for by others, and initial MBI score ($p = 0.044$) (Table 8, Figure 1 and 2).

## Discussion

From the correlation analysis, it was shown that the benefits of occupational therapy interventions were associated with the increase of the functional performance in self-care of stroke patients at home within a short period of time (28 days after discharge). The improvement is thus caused by the process of the interventions introduced by the occupational therapists to the human and non-human environments of the patients and, in turn, to the caregivers. The significant increase in MBI scoring and decrease in CSI showed that the provision of home visits by occupational therapists with on-site training, both for direct discharge stroke patients and their caregivers, is an effective approach to bringing about remarkable and immediate changes in functional and psychosocial performance. It was also shown that in the regression analysis, other than the social factors of the family that we cannot manipulate, the change in self-

**Table 6.** Pearson's correlation matrix for self-efficacy scores (SEQ and CEQ)

| | SEQ1 | SEQ2 | CEQ1 | CEQ2 | Gender | Occupation | Presocial | Dcsocial | LivingW |
|---|---|---|---|---|---|---|---|---|---|
| MBI1 | 0.3607† | 0.5070‡ | 0.2705Å₁ | | | | | | |
| MBI2 | 0.4082‡ | 0.6882‡ | 0.2993† | 0.2605† | | | | | |
| SAFER2 | | | | –0.2683† | | | | | |
| CSQ1 | | | | –0.4635‡ | | | | | |
| CSQ2 | | | | –0.4939‡ | | | | | |
| SEQ1 | | | 0.3623† | | | | | | |
| SEQ2 | | | | 0.3254† | 0.2313* | –0.2999† | | | |
| CEQ1 | | | | | | | 0.3052† | 0.2173* | |
| CEQ2 | | 0.230* | | | | | 0.2725† | 0.2894† | 0.2275* |

SEQ = self-efficacy scale for patients; CEQ = self-efficacy scale for caregivers; Presocial = social support at admission; Dcsocial = social support at discharge; LivingW = type of caregiver at home; MBI = Modified Barthel Index; SAFER = SAFER Safety Assessment of Function and the Environment for Rehabilitation assessment; CSQ = Caregiver Strain Index; '1' = pre-testing score; '2' = post-testing score.

*Correlation is significant at the 0.05 level (two-tailed) ($p < 0.05$); †Correlation is significant at the 0.01 level (two-tailed) ($p < 0.01$); ‡Correlation is significant at the 0.000 level (two-tailed).

**Table 7.** Regression analysis of self-efficacy scores (SEQ) of patients

**ANOVA**[b]

| Model | | Sum of Squares | df | Mean Square | F | Sig |
|---|---|---|---|---|---|---|
| 1 | Regression | 3656.758 | 16 | 228.547 | 7.080 | 0.00[a] |
| | Residual | 2066.008 | 64 | 32.281 | | |
| | Total | 5722.765 | 80 | | | |

a. Predictors: (Constant), CEQ2, AGE, HOSP, SEX, MBI1, EDUCATIO, OTHERDX, SAFER2, CAREGIVE, LIVINGW, PRESOCIA, CEQ1, DCSOCIAL, SAFER1, OCCUPATI, MBI2

b. Dependent variable: SEQ2

**Coefficients**[a]

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig.95% | Confidence Interval for B | |
|---|---|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | | Lower Bound | Upper Bound |
| 1 | (Constant) | 4.905 | 8.392 | | 0.584 | 0.561 | –11.860 | 21.669 |
| | OCCUPATI | –5.052E-05 | 0.437 | 0.000 | 0.000 | 1.000 | –0.874 | 0.873 |
| | EDUCATIO | 1.833 | 0.864 | 0.195 | 2.122 | 0.038 | 0.108 | 3.559 |
| | SEX | –3.284 | 2.450 | –0.194 | –1.340 | 0.185 | –8.178 | 1.611 |
| | AGE | 0.389 | 0.880 | 0.037 | 0.442 | 0.660 | –1.369 | 2.146 |
| | HOSP | –0.236 | 0.366 | –0.072 | –0.646 | 0.520 | –0.967 | 0.495 |
| | LIVINGW | –2.256 | 1.783 | –0.122 | –1.266 | 0.210 | –5.818 | 1.305 |
| | CAREGIVE | –0.422 | 0.430 | –0.085 | –0.980 | 0.331 | –1.281 | 0.438 |
| | OTHERDX | –0.303 | 0.168 | –0.153 | –1.799 | 0.077 | –0.639 | 0.034 |
| | PRESOCIA | –1.297 | 0.962 | –0.151 | –1.348 | 0.182 | –3.218 | 0.624 |
| | DCSOCIAL | 1.771 | 1.047 | 0.196 | 1.691 | 0.096 | –0.321 | 3.863 |
| | MBI1 | –0.140 | 0.082 | –0.316 | –1.698 | 0.094 | –0.304 | 0.025 |
| | MBI2 | 0.424 | 0.085 | 0.907 | 4.968 | 0.000 | 0.254 | 0.595 |
| | SAFER1 | 0.393 | 0.241 | 0.213 | 1.629 | 0.108 | 0.089 | 0.874 |
| | SAFER2 | –0.467 | 0.392 | –0.143 | –1.191 | 0.238 | –1.250 | 0.316 |
| | CEO1 | 6.118F-02 | 0.082 | 0.080 | 0.751 | 0.456 | –0.102 | 0.224 |
| | CEO2 | 7.547F-02 | 0.107 | 0.079 | 0.708 | 0.482 | –0.138 | 0.289 |

a. Dependent variable: SEQ2

**Table 8.** Regression analysis of self-efficacy scales (CEQ) of caregivers

**ANOVA**[b]

| Model | | Sum of Squares | df | Mean Square | F | Sig |
|---|---|---|---|---|---|---|
| 1 | Regression | 3509.018 | 17 | 206.413 | 4.712 | 0.00[a] |
| | Residual | 2715.732 | 62 | 43.802 | | |
| | Total | 6224.750 | 79 | | | |

a. Predictors: (Constant), CEQ1, OCCUPATI, EDUCATIO, AGE, LIVINGW, OTHERDX, CAREGIVE, SAFER2, HOSP, MBI1, PRESOCIA, SEQ2, SEA1, DCSOCIAL, SAFER1, SEX, MBI2

b. Dependent Variable: CEQ2

**Coefficients**[a]

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig.95% | Confidence Interval for B | |
|---|---|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | | Lower Bound | Upper Bound |
| 1 | (Constant) | –5.623 | 10.479 | | –0.537 | 0.593 | –26.570 | 15.324 |
| | OCCUPATI | 0.347 | 0.515 | 0.109 | 0.674 | 0.503 | –0.682 | 1.376 |
| | EDUCATIO | –3.392E-02 | 1.052 | –0.003 | –0.032 | 0.974 | –2.136 | 2.068 |
| | SEX | 1.356 | 2.921 | 0.076 | 0.464 | 0.644 | –4.483 | 7.194 |
| | AGE | –0.219 | 1.038 | –0.020 | –0.211 | 0.834 | –2.295 | 1.857 |
| | HOSP | 0.720 | 0.747 | 0.209 | 1.520 | 0.134 | –0.227 | 1.667 |
| | LIVINGW | 4.337 | 2.050 | 0.225 | 2.115 | 0.038 | 0.238 | 8.435 |
| | CAREGIVE | 0.448 | 0.502 | 0.087 | 0.893 | 0.375 | –0.555 | 1.452 |
| | OTHERDX | –0.107 | 0.202 | –0.051 | –0.528 | 0.600 | –0.511 | 0.298 |
| | PRESOCIA | 2.170 | 1.193 | 0.242 | 1.818 | 0.074 | –0.216 | 4.555 |
| | DCSOCIAL | 0.103 | 1.326 | 0.011 | 0.078 | 0.938 | –2.548 | 2.754 |
| | MBI1 | –0.210 | 0.102 | –0.450 | –2.061 | 0.044 | –0.414 | –0.006 |
| | MBI2 | 0.206 | 0.120 | 0.419 | 1.717 | 0.091 | –0.034 | 0.445 |
| | SAFER1 | –1.434E-02 | 0.289 | –0.007 | –0.050 | 0.961 | –0.593 | 0.564 |
| | SAFER2 | –0.687 | 0.489 | –0.191 | –1.404 | 0.165 | –1.665 | 0.291 |
| | SEQ2 | 2.818E-02 | 0.161 | 0.027 | 0.175 | 0.861 | –0.293 | 0.350 |
| | SEQ1 | 0.119 | 0.128 | 0.122 | 0.935 | 0.353 | –0.136 | 0.375 |
| | CEQ1 | 0.371 | 0.087 | 0.461 | 4.258 | 0.000 | 0.197 | 0.546 |

a. Dependent variable: SEQ2

efficacy scores was contributed mainly by the improved functional performance of the clients. Therefore, the blending of effects on the intrinsic and extrinsic factors introduced by the occupational therapy interventions is beneficial on a holistic level.

As Bandura (1977) has previously suggested, patients' improvement in self-efficacy also showed a lasting effect in the self-reported functional health status and "going out" frequency in the majority of patients, which was maintained for up to 3 months. Our results were consistent with the results of Walker, Hawkins, Gladman et al. (2001), who in a single blinded, randomised, controlled trial, and showed that occupational therapy is highly beneficial for achieving a higher level of independence. This benefit likewise included instrumental Activities of Daily Living, self-care, agility, and improvements to caregiver strain for up to 1 year, for patients with stroke who remained in the community.

From our previous experience, the first 28 days is the critical adjustment period for patients and their families, affecting how they can adapt to the patient's disability and accept a new way of life (Gitlin, Corcoran and Leimiller-Eckhardt, 1995). Based on our results, Self-Efficacy Scale – HK seems to be a promising index for the therapists to predict the level of adaptation and acceptance of the patients and their caregivers. Hence, it is suggested that there be a provision of home-based occupational therapy support, to guarantee a 'safe discharge'.

As reflected in the results, caregiver efficacy is predicted by a perceived burden of patients (i.e. initial MBI and the living arrangement of the patients). Irrespective of the neurological recovery level and physical functioning, we found that as a patient's confidence in performing the self-care tasks increased, so too would the patient's and caregivers' confidence increase to return to home living. Therefore, in our programme, within

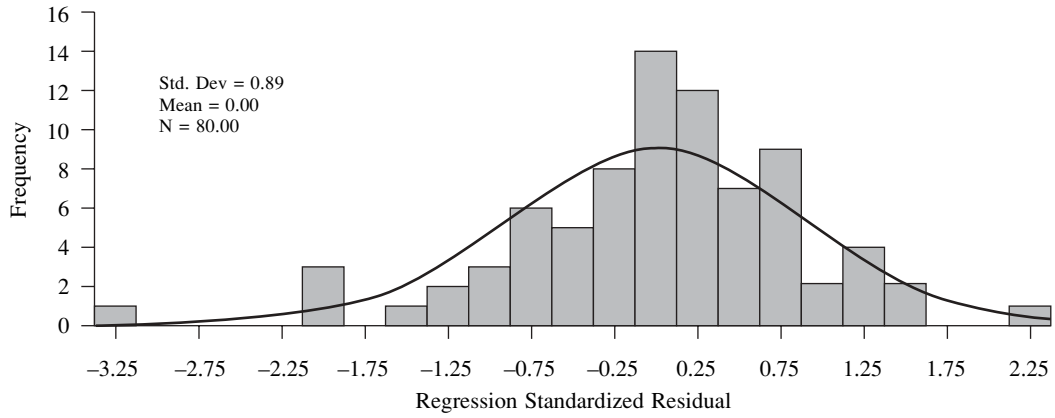


***Figure 1.*** *Histogram of dependent variable: CEQ.*

28 days post-discharge, focused and intensive home-based training, safety advice and immediate feedback to stroke patients were considered to be effective in building up patient and caregiver confidence. Good motivation and active participation in daily living tasks were some of the effective methods in regaining functional status. This effect was found to be maintained up to 3 months.

Caregivers who had experienced less strain would demonstrate higher efficacy level in caring the daily activities for the patients as these two domains were highly correlated. Through structured caregiver training, caregivers were equipped with better understanding of the effective way of handling the stroke patient and also increased their sense of control over a safe environment. These sessions greatly helped build confidence, lessen anxiety, and helped to gradually generalise problem-solving strategies to other areas. These results are consistent with what Bandura advocated that "Performance Accomplishment" is considered to be the most influential factor in the development of self-efficacy (Bandura, 1977).

To reduce accident and the fear of falls, it is a more cost-effective strategy to increase the sense of control over the environment through early provision of on-site demonstration of safety methods and problem solving strategies, which can also include resources guidance (Kressig, Wolf, Sattin et al., 2001). It is worthwhile to extend this concept of discharge process to other chronic-disease groups with major changes in patient's level of functioning and habits in daily living.

The fall rate reported in our sample (7%) is lower than results from another similar local study (11.5%) (Sze, Wong, Leung et al., 2001). However, the results in our study may not be reliable, due to self-reporting and the nature of telephone follow-up only.

Other benefits of this treatment strategy include shorter duration of active treatment post-discharge in comparing with traditional community rehabilitation service, standardised safety training, and education to patients and caregivers. The long-term outcome, however, could have been better documented had the sample been followed for up from 6

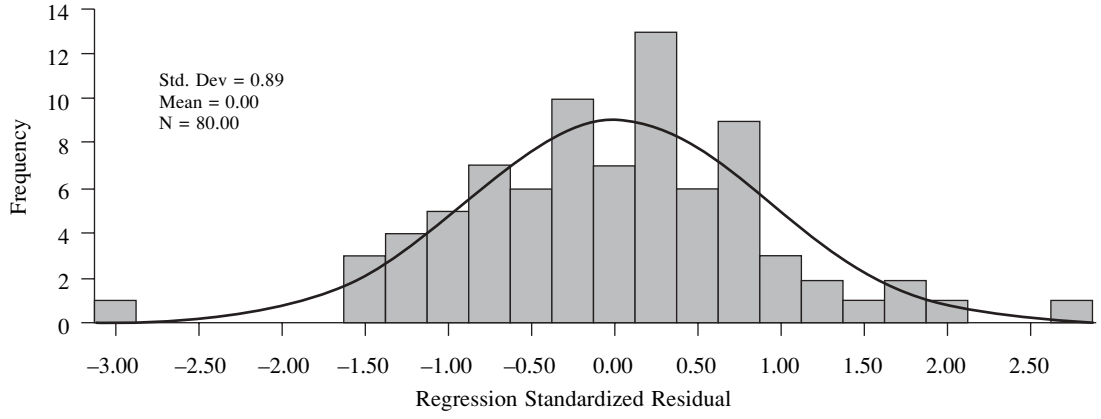


***Figure 2.*** *Histogram of dependent variable: SEQ.*

months to 1 year. Furthermore, in our telephone follow-up, we only contacted 70% of the subjects in the initial sample group. Our results may be biased towards the more vocal and active group. The costing factor will also be worth studying in future.

## Conclusion

Home-based occupational therapy programme is direct and effective in dealing with both the intrinsic and extrinsic factors of stroke that lead to home safety problems. The nature of benefits is blended and comprehensive. For the short-stay patients, directly discharged to their homes with caregivers, occupational therapy interventions are effective in improving functional status, reducing caregiver strain and reducing risks in their daily lives. These interventions also showed a positive and lasting effect in improving the self-efficacy of our patients and caregivers. These two important actions are believed to contribute significant positive effects in establishing a safer, less stressful and more active lifestyle, compared to the conventional discharge process from acute-stroke wards. Occupational therapist and family members can help build up a stroke patient's self-confidence and efficacy in exercising a healthy and active life.

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